

What is claimed is:

1. A vibration generator comprising:
  - a vibration generation portion 1 having a spring member 2, a permanent magnet 3 and an electromagnetic coil 4, said permanent magnet being disposed on the spring member in a confronting spaced relation with the permanent magnet,
  - a driving circuit 5 for driving the vibration generator portion 1 to obtain a vibration force,
  - 10 a casing 12 for housing the vibration generation portion and the driving circuit 5,
    - wherein the spring member 2 is formed of a U-shaped leaf spring to provide a vibration portion so that an actual length of vibration portion is increased.
- 15 2. A vibration generator according to claim 1, wherein one end of the spring member 2 is directly fixed to, by soldering or adhesive agent, to a printed circuit board 6 of the driving circuit.
- 20 3. A vibration generator according to claim 1, wherein a weight 8 is provided at an end of the leaf spring 2 for permitting an efficient conversion of the driving energy of the electromagnetic coil into a vibration energy.

4. A vibration generator according to claim 1, wherein the casing 12 has an opening 13 at the portion where the end of the leaf spring 2 is located so that the weight can partly move out of the opening of the casing.

5 5. A vibration generator having a vibration generating portion 21 and a driving circuit 25 for driving the vibration generating portion to obtain a vibration force, comprising:

10 a leaf spring 22 having a U-shaped vibration portion,  
a permanent magnet 23 and an electromagnetic coil 24,  
the permanent magnet 23 being disposed on the leaf spring 22  
in a spaced confronting relation with the electromagnetic coil  
24, and

15 a power supply terminal device 30 for resiliently pressing from  
upward the vibration generation portion 21.

15 6. A vibration generator according to claim 5, wherein a weight is fixed to  
the end of the vibration portion.

20 7. A vibration generator according to claim 5, wherein the leaf spring is  
combined with a yoke plate made of iron type materials so that the leaf  
spring is structurally integral with the yoke plate.

25 8. A vibration generator according to claim 5, wherein an adhesion means  
using an adhesive tape is used along with, and in combination with, a  
resilient pressing force of the power supply terminal device.

RIGHT  
TOP  
DOWN  
LEFT  
MIDDLE

9. A vibration generator according to claim 5, wherein the leaf spring and the power supply terminal are made of phosphor bronze.
10. A vibration generator according to claim 5, wherein the permanent magnet is press-fitted to the leaf spring to thereby simplify the fixing manner and arrangement and also provide a reliable fitting of the elements.
11. A vibration generator according to claim 5, wherein the permanent magnet 23 is press-fitted to the leaf spring 22 and the press-fitting portion can be adhered by means of an adhesive agent.
12. A vibration generator according to claim 6, wherein the weight 28 is anchored by holding it between the leaf spring 22 and the yoke plate 29.
13. A vibration generator according to claim 6, wherein the weight 28 is held between the leaf spring 22 and the yoke plate 29 such that the holding portion is provided with an adhesive agent.
14. A vibration generator according to claim 5, wherein the power supply terminal device 30 is fixed to the circuit board by soldering.
15. A vibration generator according to claim 5, wherein the power supply terminal device 30 has a resistive terminal plate 31 having falling-prevention ribs 32.

*Sulal* →  
16. A vibration generator according to claim 1 or 5, wherein the vibration generator is used for portable phones.

*add as* →